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ONS-2017-064

September 20, 2017 10 CFR 50.73

Attn: Document Control Desk
U. S. Nuclear Regulatory Commission
11555 Rockville Pike
Rockville, MD 20852-2746

Duke Energy Carolinas, LLC
Oconee Nuclear Station, Unit 3
Docket Number: 50-287
Renewed Operating License DPR-55

Subject: Licensee Event Report 287/2017-001, Revision 0 - Unit 3 Reactor Protection System Actuation - Reactor Trip Due to Turbine Trip from Generator Lockout

Licensee Event Report 287/2017-001, Revision 0, is being submitted pursuant to the requirements of 10 CFR 50.73(a)(2)(iv)(A) to provide a report of the subject event.

There are no regulatory commitments associated with this LER.

If there are questions, or further information is needed, contact David Haile, in Oconee Regulatory Affairs, at (864) 873-4742.

Sincerely,

Carrie T. Dunton
Director, Nuclear Site Support
Oconee Nuclear Station

Enclosure: Licensee Event Report 287/2017-001, Revision 0 - Unit 3 Reactor Protection System Actuation - Reactor Trip Due to Turbine Trip from Generator Lockout.

IE22
NRR

cc :

Ms. Catherine Haney, Administrator, Region II
U.S. Nuclear Regulatory Commission
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Ms. Audrey L. Klett, Project Manager
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Mr. Eddy Crowe
NRC Senior Resident Inspector
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INPO (Word File via E-mail)

NRC FORM 366 U.S. NUCLEAR REGULATORY COMMISSION
(04-2017)

LICENSEE EVENT REPORT (LER)

(See Page 2 for required number of digits/characters for each block)

(See NUREG-1022, R.3 for instruction and guidance for completing this form http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/)

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 03/31/2020

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Information Services Branch (T-2 F43), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
Oconee Nuclear Station Unit 3	5000287	1 of 3

4. TITLE

Unit 3 Reactor Protection System Actuation - Reactor Trip due to Turbine Trip from Generator Lockout

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
									NA	5000
07	24	2017	2017	- 001	- 00	09	20	2017	FACILITY NAME: NA	DOCKET NUMBER: 5000

9. OPERATING MODE	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: *(Check all that apply)*			
Mode 1	☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(viii)(A)
	☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
	☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
	☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☒ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
10. POWER LEVEL	☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
	☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
	☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(C)	☐ 73.77(a)(1)
100%	☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(D)	☐ 73.77(a)(2)(i)
	☐ 20.2203(a)(2)(vi)	☐ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(vii)	☐ 73.77(a)(2)(ii)
		☐ 50.73(a)(2)(i)(C)	☐ OTHER Specify in Abstract below or in NRC Form 366A	

12. LICENSEE CONTACT FOR THIS LER

LICENSEE CONTACT	TELEPHONE NUMBER *(Include Area Code)*
David Haile, Oconee Regulatory Affairs	864-873-4742

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX
NA					NA				

14. SUPPLEMENTAL REPORT EXPECTED	15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
☐ YES *(If yes, complete 15. Expected Submission Date)* ☒ NO				

ABSTRACT *(Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)*

On 7/24/17, with Oconee Nuclear Station (ONS) Unit 3 operating at 100 percent power, Transmission Department Relay personnel were in the ONS 525kV Switchyard Relay House performing preventive maintenance on a Breaker Failure Relaying device for Power Circuit Breaker PCB-57. This is a non-safety PCB that isolates a commercial transmission line from the commercial bus in the 525kV switchyard. The maintenance was intended to actuate the protective relaying for PCB-57. The crew inadvertently connected test equipment to the adjacent relaying for PCB-58. The activation of the PCB-58 relay resulted in a Unit 3 separation from the electrical grid and a generator "Lockout." The lockout generates a turbine trip which in turn trips the reactor via the Reactor Protection System (RPS). This actuation of the RPS is reportable per 10 CFR 50.73(a)(2)(iv)(A).

Post trip plant response was normal and plant conditions were controlled and maintained within the allowances of Technical Specifications with no personnel injuries or safety system actuations.

A cause analysis attributed the cause of this event to human error in that test equipment was inadvertently connected to relaying for the incorrect PCB. The cause analysis corrective actions will address the likelihood of comparable human errors from occurring.

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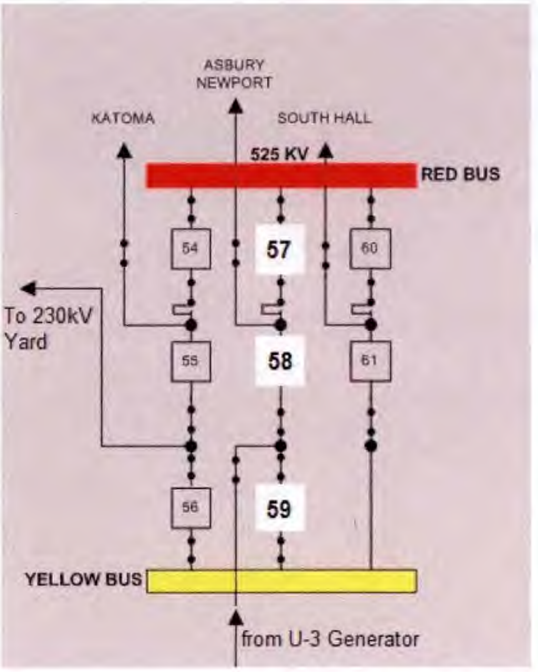
EVALUATION:

BACKGROUND

The sketch on the right depicts the 525kV power circuit breaker (PCB) arrangement.



The Red Bus[EA] and the Yellow Bus[EA] are commercial, non-safety buses.

Transmission crews are not part of the nuclear plant's staff, but are responsible for performing work in the 525kV switchyard[FK]. The coordination, planning, and execution of Transmission work activities are controlled by several approved processes which establish communication and approval protocols between the Nuclear and Transmission organizations.

EVENT DESCRIPTION

On 7/24/17, with ONS Unit 3 operating at 100% power, Transmission Department Relay personnel in the ONS Switchyard Relay House were performing preventive maintenance on a relay device associated with PCB-57. This is a non-Unit PCB that isolates a commercial transmission line from the Red Bus in the 525kV switchyard.

The maintenance procedure first opens and isolates PCB-57, then triggers the protective relaying while ensuring that the PCB trip function actuates properly. In this case the Transmission crew inadvertently connected the test equipment to the incorrect relay device (several identical relay devices are mounted in one cabinet but actuate separate PCBs). The crew connected test equipment to the adjacent relay device for PCB-58 instead of the relay device for PCB-57. PCB-58 is a Unit breaker that connects the Unit 3 generator output[EL] to the switchyard buses. Activating a test signal on the PCB-58 relay device resulted in Unit 3 generator "lockout" and a loss of electrical load by tripping open PCB-58 and PCB-59. The lockout generates a turbine trip which in turn trips the reactor via the Reactor Protection System (RPS)[JC].

The reactor trip was uncomplicated, with all systems responding normally.

CAUSAL FACTORS

One cause is attributed to a lack of rigor by the Transmission technicians in utilizing appropriate Human Performance tools to ensure their actions were performed on the intended component.

A second cause is attributed to a lack of coordination between the Transmission and Nuclear organizations for implementation of interface processes regarding the risk of work performed in close proximity of the PCB-58 relay device.

Transmission personnel are accountable for the use of human performance tools to ensure component identification is correct and maintained during maintenance. These tools include component markers and physical barriers to ensure maintenance is only performed on the assigned component. These types of tools were not adequately applied during performance of this task.

The interface guidelines call for Transmission to have work plan communications with the appropriate nuclear site groups so a risk assessment for the need of nuclear site oversight can be made. A breakdown in this communication led to a misunderstanding of the risk associated with this work (close

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proximity to the PCB-58 relay device) and thus the coordination and oversight of this work was inadequate.

CORRECTIVE ACTIONS

This event was entered into the Corrective Action Program (NCR 02138958) which included a cause analysis. The cause analysis corrective actions are summarized as follows:

- In order to improve the application of human performance rigor and the recognition of operational risks when working in the switchyard relay cabinets;
    1. Training, applicable to this event, will be provided to the necessary groups,
    2. Cabinet/relay labeling will be enhanced, and
    3. Interface guidance applicable to this event will be improved.
- The site work planning and approval processes will be improved for work within the site switchyards that require coordination with the Transmission department.

SAFETY ANALYSIS

Loss of electrical load from 100 percent power is an analyzed event described in the ONS Updated Final Safety Analysis Report, Section 15.8. All onsite safe shutdown equipment performed as required with no complications. Therefore this event did not present a risk to the health and safety of the plant or the public.

ADDITIONAL INFORMATION

Energy Industry Identification System (EIIS) codes are identified in the text as [XX].

Similar Events:

None